



## CASE STUDY LEAK SEAL

### Below-Grade Tunnel Leak Remediation

A persistent water infiltration was observed in a below-grade tunnel in Houston, TX. Staining on the sheetrock ceiling indicated the leak originated at the joint between the tunnel shell and the building wall, specifically at the interface with the flashing. The tunnel was situated on the negative pressure side of the structure, resulting in recurring water intrusion issues. The property management team sought technical advice to resolve the leak without extensive demolition or disruption to the building's operations.

#### Initial Assessment

Visual inspection confirmed that water was entering through the wall/flashing joint and migrating into the tunnel ceiling. The stains and moisture patterns suggested a continuous leak path exacerbated by negative hydrostatic pressure. The location and nature of the leak made traditional surface repairs ineffective, as water was entering from behind the structure and not from an exposed face.



#### Proposed Solution

Alchatek recommended injecting the joint between the tunnel shell and the building wall with Spetec PUR F400, a hydrophobic polyurethane grout. This product was chosen for its ability to react with water and expand, effectively sealing active leaks even under negative pressure. The material's low viscosity allows it to penetrate tight joints and bond with both concrete and steel, creating a durable, watertight seal. The recommended installation method involved using a Titan 440 electric injection pump, ensuring the grout was injected until the joint could no longer accept any more material.

#### Procedures

1. The team identified the leaking joint at the wall/flashing interface as the primary injection target.
2. Injection ports were installed along the joint to provide access for the polyurethane grout.
3. Spetec PUR F400 was injected using an electric injection pump, with technicians monitoring for material refusal and observing for any signs of milky fluid or foam, which indicated grout migration.
4. Injection continued until the joint was fully saturated and would not accept additional material, ensuring complete sealing of the leak path.
5. The process required no pre-pumping or removal of water from the joint, as the hydrophobic grout was designed to react in wet conditions.

#### Results

The polyurethane injection successfully sealed the leak at the tunnel shell/building wall joint. Post-repair observations showed no further water staining or active intrusion in the tunnel ceiling, and the tunnel remained dry even during subsequent rain events. The method enabled targeted remediation with minimal disruption to building occupants and eliminated the need for costly demolition or exterior excavation. The use of Spetec PUR F400 provided a cost benefit of 96% compared to traditional invasive repair methods. The property management team was satisfied with the outcome and the efficiency of the repair process.

### About Alchatek

Alchatek is an international leader in the manufacture and supply of chemical grouts and construction products for Geotechnical, Leak Seal, and Seawall Repair applications. Providing solutions from its headquarters in Tucker, Georgia and its manufacturing facility in Reno, Nevada, Alchatek specializes in advanced construction technologies for sealing leaks, stabilizing soils, lifting concrete, and protecting infrastructure and seawall structures. To best serve its customers, Alchatek is organized onto three divisions:

**The Leak Seal Division** combines a full system offering of polymer chemical grouts and equipment with perhaps the most experienced technical team in the industry. It specializes in preventing water ingress through concrete infrastructure including parking garages, culverts, basements and foundations, and sewer manholes.

**The Geotechnical Division** offers a complete line of single component products for soil stabilization as well as two component polyurethane foams for concrete lifting, void filling, and stabilization of infrastructure. This includes lifting sunken structures such as warehouse floors, back into place.

**Seawall Repair Network®** is the only national network of certified contractors in the repair, preservation, and protection of Seawalls waterfront barriers. Its proprietary methods and materials are environmentally friendly and safe for use in all marine environments and provide a non-destructive solution for seawall repair at 80% less than the cost of replacement.

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